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PREIMPLANTATION GENETIC TESTING FOR ANEUPLOIDY IN DONOR OOCYTE IVF CYCLES: A MATCHED, SIBLING OOCYTE COHORT STUDY

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OBJECTIVE:

The use of preimplantation genetic testing for aneuploidy (PGT-A) has been shown to improve live birth rate per embryo transfer (ET) and reduce pregnancy loss.[1] Whether PGT-A is beneficial in donor oocyte recipient cycles, with lower expected rates of aneuploidy, is less clear.[2-4] A major concern is the possible lower positive predictive value of PGT-A when the technology is used to screen young donor-oocyte derived embryos, which may reduce the number of healthy embryos available for transfer and/or cryopreservation. This study aims to compare the overall IVF cycle efficacy and efficiency in recipients of sibling donor oocytes who did and did not utilize PGT-A.

DESIGN:

Retrospective, matched cohort study

MATERIALS AND METHODS:

The study included single embryo transfers in recipients of sibling oocytes from the same donor in which one recipient utilized PGT-A ("PGT-A" group) and the other recipient did not ("unscreened" group) from September 2016 to March 2020. Donors underwent controlled ovarian hyperstimulation and the retrieved oocytes were divided equally among the recipients. PGT-A was performed using Next Generation Sequencing. Baseline characteristics including age, BMI, endometrial thickness, use of donor sperm, fresh vs. frozen embryo transfer, embryo age, and embryo quality were compared between the groups. Outcomes included cycle efficiency,

defined as percentage of fertilized oocytes that were transferred and/or cryopreserved, as well as clinical pregnancy, live birth, and pregnancy loss rates. Comparative statistics and linear and logistic regression were used for analysis.

RESULTS:

The study included a total of 50 matched pairs, or 100 oocyte recipient cycles. Average oocyte age was 26.5±2.7 years. The groups were similar in terms of recipient age and BMI. The PGT-A group had a significantly lower endometrial thickness, lower rate of donor sperm use, higher proportion of frozen-thawed embryo transfers, and lower proportion of day 5 vs. day 6 embryos transferred compared to the unscreened group. With regards to embryo quality, the PGT-A group had significantly higher expansion grades, similar inner cell mass morphology grade, and a higher proportion of trophectoderm grade B. Cycle efficiency was similar between the groups (60.7±0.2% vs. 56.5±0.2%, p=0.44). On multivariate logistic regression, no significant differences were seen between the PGT-A and unscreened groups in clinical pregnancy rate (OR 0.85, 95% CI 0.26-2.73, p=0.79), live birth rate (OR 1.93, 95% CI 0.51-7.35, p=0.33), or pregnancy loss rate (OR 0.65, 95% 0.11-3.69, p=0.63) when controlling for confounders.

CONCLUSIONS:

Our study which utilized a sibling donor oocyte matched model failed to demonstrate alterations in cycle outcome in cases with embryos that had undergone PGT-A. We did not observe a reduced number of embryos available for transfer or cryopreservation, suggesting that the use of PGT-A does not reduce treatment efficiency. Recipients who desire the use of PGT for sex selection or aneuploidy screening can be reassured that this technology is safe and will not reduce the number of embryos available for treatment.

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